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(71) Applicant: NEEDLE TECHNOLOGY (AUST) LIMITED [AU/AU]; Suite 2, 78 Glebe Road, The Junction, NSW 2291 (AU).

(71)(72) Applicants and Inventors: GALPIN, Kim, Robert [AU/AU]; 37 Macquarie Street, Merewether, NSW 2291 (AU). WALTON, Graeme, Francis [AU/AU]; 41 Kilkera Avenue, Valentine, NSW 2280 (AU).

(74) Agent: SPRUSON & FERGUSON; G.P.O. Box 3898, Sydney, NSW 2001 (AU).

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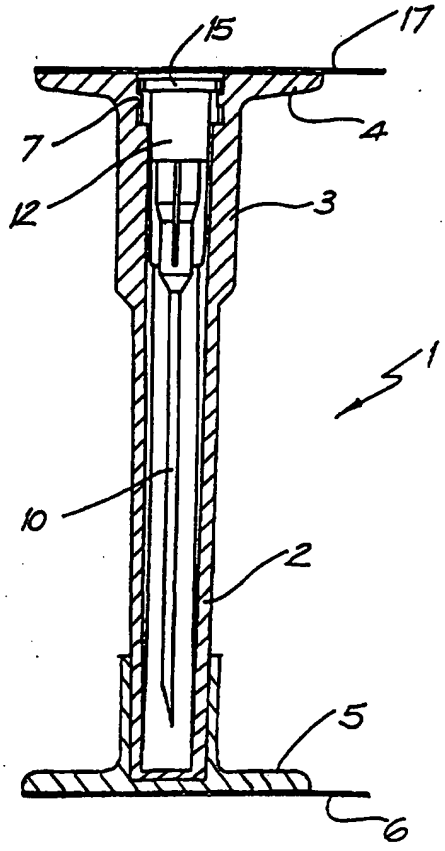
(54) Title: NEEDLE HOUSING

(57) Abstract

A needle housing (1) comprises an upper wall portion (3) and a lower wall portion (2) with annular skirt (4) and annular base (5). Base (5) has located beneath it a layer of an adhesive impregnated material (6) or alternatively a roughened anti-slip friction surface. An internal protrusion (7) extends into the housing below skirt (4). Protusion (7) is adapted to lightly engage surface (16) of the external peripheral surface of needle boss (12) prior to use. To hermetically seal the needle boss (12) and needle (10) into the housing (1), a sealing element such as a tear-off tab (17) is adhered to the upper surface of the skirt (4). Housing (1) may be held by a user or attached or otherwise supported upon a fixed horizontal surface prior to removal of needle (10) and needle boss (12) for use. Upon peeling the tear-off tab (17) away from skirt (4), boss (12) is revealed for fixture to a syringe for removal from housing (1). After use, the boss (12) and needle (10) are permanently reinserted firmly into the housing (1) so as to be safely retained therein beneath protrusion (7) past which boss (12) is snap engaged into housing (1).



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Needle Housing

Field of the Invention

This invention relates to needle housings and more particularly to such housings as might accommodate a needle used in the medical profession or in personal drug administration so that the physician, surgeon or other needle operator might be protected form injury by the needle after its use.

The danger of injury and possible infection with the HIV or hepatitis B virus to medical practitioners using needles in the normal course of their business is well documented. Further, persons who are in the habit of administering drugs to themselves run a severe risk of contacting either the specified viruses, or indeed contacting other viruses if a needle, once used, is reused in an unsterilised form. Various attempts have been made to provide a safe system for disposal of such needles once used but such prior proposals have had deficiencies.

Object of the Invention

It is an object of this invention to provide apparatus for housing an unused surgical needle in a sterile manner, and for permanently storing the surgical needle, once used, in a substantially safe manner.

Disclosure of the Invention

This invention in one broad form provides a housing for releaseably securing a needle therein so as to enable the needle to be separated from the housing and used with a syringe and after said use to receive the needle for disposal with the housing, said housing comprising a base adapted to be placed on a substantially flat surface, a hollow body for receiving a needle therein, said body having opposite ends at one of which said base is disposed, a skirt located at the other of the ends of the hollow body remote from said base, said skirt being shaped to protect a person holding the body from a needle misdirected towards location in said housing, said base and said skirt being of substantially similar width, said skirt defining an opening for said hollow body at said one end through which said needle can be inserted into said hollow body, said housing having a securement means comprising at least one stopper member located therein to retain within the hollow body of the housing, a needle when located therein after use with a syringe, the housing further comprising a sealing element removably affixed to the skirt to hermetically seal the needle in a sterile state within the housing prior to use.

It is preferred that the base of the needle housing of this invention be circular and be provided on its underside with a friction surface of roughened rubber for example having anti-slip properties, or alternatively, any anti-slip adhesive means such as a pad impregnated with adhesive material, that pad being covered with a removable plastics or other shield. For example, the removable plastics or other shield may be a hot melt resin

rubber base tape. Once the plastics shield is removed from the adhesive material, the housing base may be located on or secured to a flat surface such that when the housing itself is held by the left hand (of a right handed person) the housing will resist movement relative to the base on which it is located, although the housing might be removed by hand pressure from that base after a needle is secured in the housing.

It is further preferred that the aforesaid skirt located at the opposite end of the needle housing from the base, be annular and be integral with the housing.

It is further preferred that the securement means be provided by one or more protrusions within the housing and adapted to prevent removal therefrom of a used needle, once that used needle is located in the needle housing of this invention.

It is further preferred that the securement means be adapted to frictionally engage an annular or frusto-conical peripheral surface of a needle boss in which the needle is supported. Such frictional engagement is aimed at retaining the needle boss such that prior to use, the needle boss and needle will be securely retained within the housing.

It is further preferred that a luminous band or other indicator be provided on the upper surface of the skirt. Such a luminous band may enable a user to guide a needle into the housing in conditions of poor lighting.

Preferably, the skirt is substantially flat and the sealing element is a tear-off tab adhered to an upper surface of the skirt.

Preferably, said opening is so dimensioned as to receive a leur-lock portion of a syringe.

Preferably, said securement means comprises snap-engagement means to retain said needle boss.

Preferably, said needle boss comprises leur-lock engagement means for engagement with a leur-lock portion of a syringe.

Preferably, said securement means comprises internal thread to retain said needle boss.

Preferably, said securement means further comprises a pair of diametrically opposed elongate slots, and wherein said needle boss comprises a corresponding pair of diametrically opposed elongate tabs adapted to be received within the respective slots so as to prevent rotation of the needle boss with respect to the housing.

Alternatively, said securement means comprises bayonet engagement means to retain said needle boss, said bayonet engagement means comprising a pair of elongate slots diametrically opposed within the housing and having a bayonet lug at an upper end thereof, and wherein said needle boss comprises a diametrically opposed pair of elongate tabs adapted to pass into the slots in the housing and whereupon turning the needle boss, said tabs lock beneath the bayonet lugs.

Brief Description of the Drawings

Preferred forms of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 depicts a needle housing with a needle being located in that housing prior to use;

Fig. 2 depicts the needle housing according to Fig. 1 with a needle located therein after use;

Fig. 3 depicts an alternative needle housing with a needle being located in that housing prior to use;

Fig. 4 depicts the needle housing according to Fig. 3, with the needle located therein after use;

Fig. 5 depicts yet a further needle housing with a needle being located in that housing prior to use;

Fig. 6 depicts the needle housing according to Fig. 5, with a needle located therein after use;

Fig. 7 depicts an alternative needle housing with a needle being located in that housing after use;

Fig. 7A is a partial internal cross-sectional elevational view depicting one alternative slotted arrangement by which the purpose-designed needle boss of Fig. 7 may be prevented from rotating within the housing of Fig. 7; and

Fig. 7B is a schematic cross-sectional elevational view of a bayonet arrangement, being an alternative to that as depicted in Fig. 7A.

Description of the Preferred Embodiment

In Figs. 1 and 2 of the accompanying drawings there is schematically depicted a needle housing 1 comprising an upper wall portion 3 and a narrower, lower wall portion 2 with annular skirt 4 and annular base 5. Base 5 has located beneath it a layer of adhesive impregnated material 6 or alternatively a roughened anti-slip friction surface such as rubber for example, to allow needle housing 1 to be securely placed upon a flat surface.

A pair of diametrically opposed internal protrusions 7 extend inwardly from just beneath skirt 4 and are formed integrally with the housing. Protrusions 7 may be replaced by a plurality of stopper (or teeth) members or other securement means such as boss 12 prior to the needle's first use.

In use, housing 1 is attached or otherwise supported above a fixed horizontal surface and is adhered thereto or otherwise secured against slipping thereon by way of adhesive or anti-slip surface 6. Housing parts 2 or 3 may then be held by the thumb and one or more fingers of a user. Annular skirt 14 protects this portion of the operator's anatomy should the needle be detached from the syringe or should the syringe be misdirected in an attempt to locate needle 10 in housing 1. To this end, a luminous band 14 may be

provided in the upper surface of skirt 4. Once the needle support 10 is introduced into the housing 1, an annular flange 15 provided about the periphery of needle boss 12 passes protrusions 7 at which point the syringe may be removed from its contact with needle 10 and needle boss 12. As the peripheral diameter of boss 12 is greater than or equal to the internal distance between opposing protrusions 7 in its relaxed state, a tight frictional engagement aids to prevent unwanted removal of needle 10 and needle boss 12 from housing 1. At this stage, housing 1 may be removed from the surface beneath face 5. The needle housing 1 with its contents of used needle 10 removed from syringe 11 may now be disposed of appropriately.

Prior to use of needle 10, the sealing element 17 which is typically a treated paper or plastics or other non-permeable film adhered to the upper surface 14 of the skirt 4 is peeled away therefrom to reveal needle boss 12. In the pre-use state, the upper edge of needle boss 12 resides slightly above the internally projecting protrusions 7. After use, the upper edge 15 of the needle boss 12 is firmly placed into the housing to snap past these protrusions.

In the pre-use state, the needle 10 and needle boss 12 are in a sterile state, hermetically sealed within the housing 1 by sealing element 17.

Once used, the needle and needle boss permanently secured within the housing may be disposed of without the requirement of a sharps container into which loose needles for example might be placed.

As shown in Figs. 1 and 2, the base 5 may be provided as a separate part. That is, the base 5 can comprise an upwardly extending hollow tubular portion within which the lower extremity of housing portion 2 may be tightly received. The inter engagement of these parts may be by interference fit. However, alternatively, the two parts may be glued, welded or otherwise secured together.

A further embodiment is depicted in Figs. 3 and 4. This embodiment is adapted to house a needle for a leur-lock syringe 18. A leur-lock syringe 18 comprises a broadened opening having internal thread 20 provided therein. A needle boss 12 for engagement within the leur-lock 19 comprises a pair of diametrically opposed protrusions 21, each adapted to threadingly engage with the thread 20 provided internally of the leur-lock 19. Typically, thread 20 is a double thread.

At the transition of the needle boss 12 with the needle 10, an annular lip 15 is provided. Annular lip 15 is slightly larger in diameter than the space between the corresponding annular protrusion 7 at the transition of housing parts 2 and 3.

In the pre-use state as depicted in Fig. 3, the annular lip 15 is situated above the annular protrusion 7. In use, the tear-tab 17 is peeled away from the upper surface 14 to reveal the needle boss 12. A syringe 18 having leur-lock 18 is then pushed and twisted onto the needle boss 12, though not with sufficient force to push lip 15 beyond protrusions 7. To assist in this regard, additional frictional engagement means may be provided between the housing part 3 and the region of the needle boss 12 directly above

the annular lip 15. Once threadingly engaged with the syringe 18, the needle boss 12 and needle 10 may be removed from the housing for use. After use, the needle 10 and needle boss 12 are pushed firmly into the housing such that the lip 15 snaps past protrusion 7. Protrusion 7 may be an annular ring or a series of discreet projections.

As depicted in Figs. 5 and 6, an alternative housing, rather than comprising lip 15 and protrusions 7 comprises mating thread. An external thread 22 is provided upon the lower extremity of needle boss 12, whereas internal thread 23 is provided at the transition of needle housing parts 2 and 3. These threads may be provided in the direction reverse to the direction of thread 20 in leur-lock 19.

In use, leur-lock 19 is pushed down and twisted upon needle boss 12 in a conventional manner. To remove the needle boss 12 from the housing, the syringe 18 may be twisted in the reverse direction to disengage thread 22 from thread 23. After use, the needle 10 and boss 12 may be reinserted into the housing and then twisted in the opposite direction. Note in this regard that after use, it is not necessary that the syringe 18 be removed from the housing 10. Moreover, the used syringe 18 and housing 10 may be disposed of together. Alternatively, the syringe 18 may be removed by detachment of leur-lock 19 from needle boss 12.

As shown in Fig. 7, an alternative housing is depicted into which a purpose-designed needle boss 12 for use with a leur-lock 19 syringe 18 may be housed. In the housing of Fig. 7, a pair of diametrically opposed slots 25 is formed in the internal surface of the housing. The slots extend generally vertically and are adapted to receive a corresponding pair of diametrically opposed tabs 24 being an integral part of the needle boss 12.

In one alternative arrangement as depicted in Fig. 7A, each tab 24 is to snap past a protrusion 7 just above the slot 25. Once located within slot 25, the tab, and thus the needle boss 12 is prevented from rotating such that the syringe 18 may be threadingly disengaged therefrom.

In an alternative arrangement as depicted in Fig. 7B, the diametrically opposed slots 25 comprise a bayonet type protrusion 7 at the upper end thereof. In this arrangement, the diametrically opposed tabs 24 may be passed through the aperture 26 into the slot 25. Upon rotation of the syringe 18, and thus the needle boss 12, the tab 24 rotates into position beneath the bayonet type tab 7. The syringe 18 may now be threadingly disengaged from the needle boss 12.

Although Fig. 7 depicts a leur-lock syringe, the principles of the embodiment are not to be considered as limited thereto. Moreover, a similar arrangement of tabs 24 and slots 25 may be provided in a housing adapted to house a needle boss of a leur-slip syringe.

Claims:

1. A housing for releaseably securing a needle therein so as to enable the needle to be separated from the housing and used with a syringe and after said use to receive the needle for disposal with the housing, said housing comprising a base adapted to be placed on a substantially flat surface, a hollow body for receiving a needle therein, said body having opposite ends at one of which said base is disposed, a skirt located at the other of the ends of the hollow body remote from said base, said skirt being shaped to protect a person holding the body from a needle misdirected towards location in said housing, said base and said skirt being of substantially similar width, said skirt defining an opening for said hollow body at said one end through which said needle can be inserted into said hollow body, said housing having a securement means comprising at least one stopper member located therein to retain within the hollow body of the housing, a needle when located therein after use with a syringe, the housing further comprising a sealing element removably affixed to the skirt to hermetically seal the needle in a sterile state within the housing prior to use.

2. The housing of claim 1 further comprising an anti-slip surface on the underside of the base.

3. The housing of claim 1 further comprising an adhesive surface on the underside of said base.

4. The housing of claim 3 wherein the adhesive surface comprises a pad impregnated with adhesive material.

5. The housing of claim 3 wherein the pad is covered with a removable shield.

6. The housing of claim 1 wherein said at least one stopper member comprises an annular rib protruding within the housing.

7. A housing for releaseably securing a needle as defined in claim 1, wherein said skirt is substantially annular and said base is circular, said base having a diameter substantially equal to an outside diameter of said skirt.

8. The housing of claim 1 wherein the needle is supported by a needle boss.

9. The housing of claim 1 further comprising a luminous band or indicator on the upper surface of the skirt.

10. The housing of claim 8 wherein the securement means frictionally retains the needle boss.

11. The housing of claim 8 wherein the maximum peripheral diameter of the needle boss is greater than or equal to the relaxed state internal diameter of the securement means.

12. The housing of claim 1 wherein the securement means is integral with the housing.

13. The housing of claim 1 wherein the skirt has a substantially flat upper surface and said sealing element is a tear-off tab adhered to said upper surface.

14. The housing of claim 1 wherein said opening is so dimensioned as to receive a leur-lock portion of a syringe.

15. The housing of claim 8 wherein said securement means comprises snap-engagement means to retain said needle boss.

16. The housing of claim 8 wherein said needle boss comprises leur-lock engagement means for engagement with a leur-lock portion of a syringe.

17. The housing of claim 8 wherein said securement means comprises internal thread to retain said needle boss.

18. The housing of claim 15 wherein said securement means further comprises a pair of diametrically opposed elongate slots, and wherein said needle boss comprises a corresponding pair of diametrically opposed elongate tabs adapted to be received within the respective slots so as to prevent rotation of the needle boss with respect to the housing.

19. The housing of claim 8 wherein said securement means comprises bayonet engagement means to retain said needle boss, said bayonet engagement means comprising a pair of elongate slots diametrically opposed within the housing and having a bayonet lug at an upper end thereof, and wherein said needle boss comprises a diametrically opposed pair of elongate tabs adapted to pass into the slots in the housing and whereupon turning of the needle boss, said tabs lock beneath the bayonet lugs.

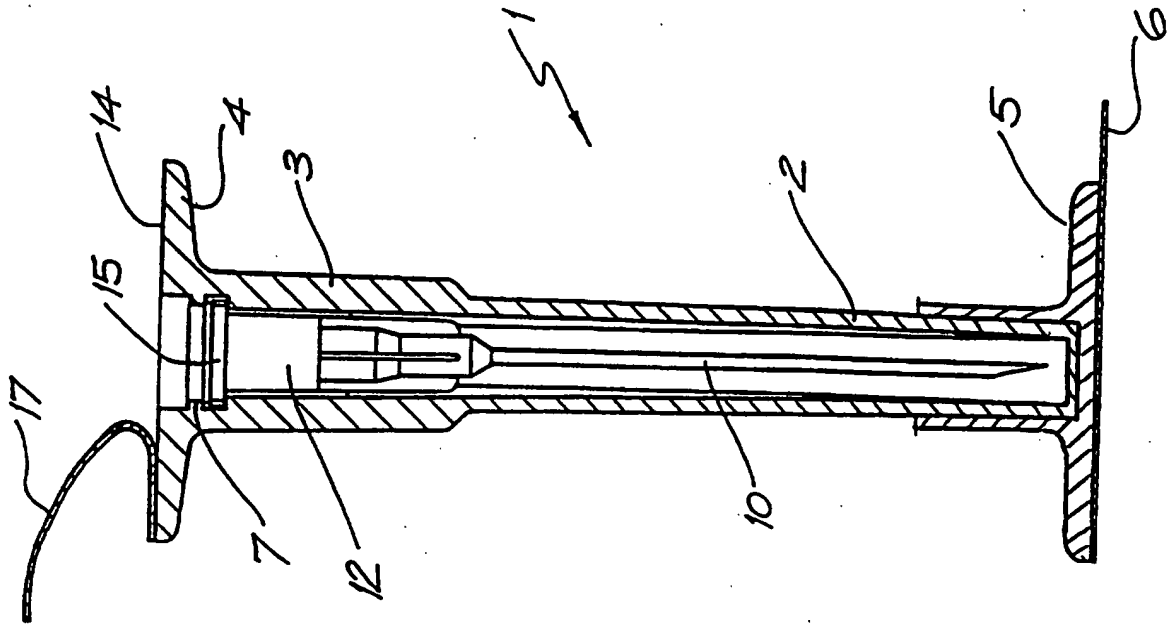

FIG. 2

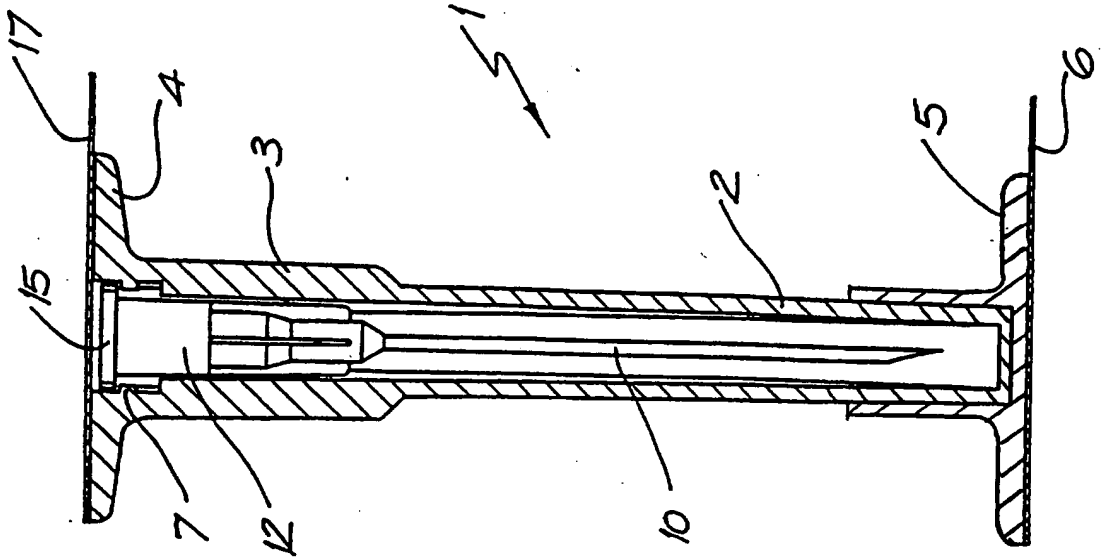

FIG. 1

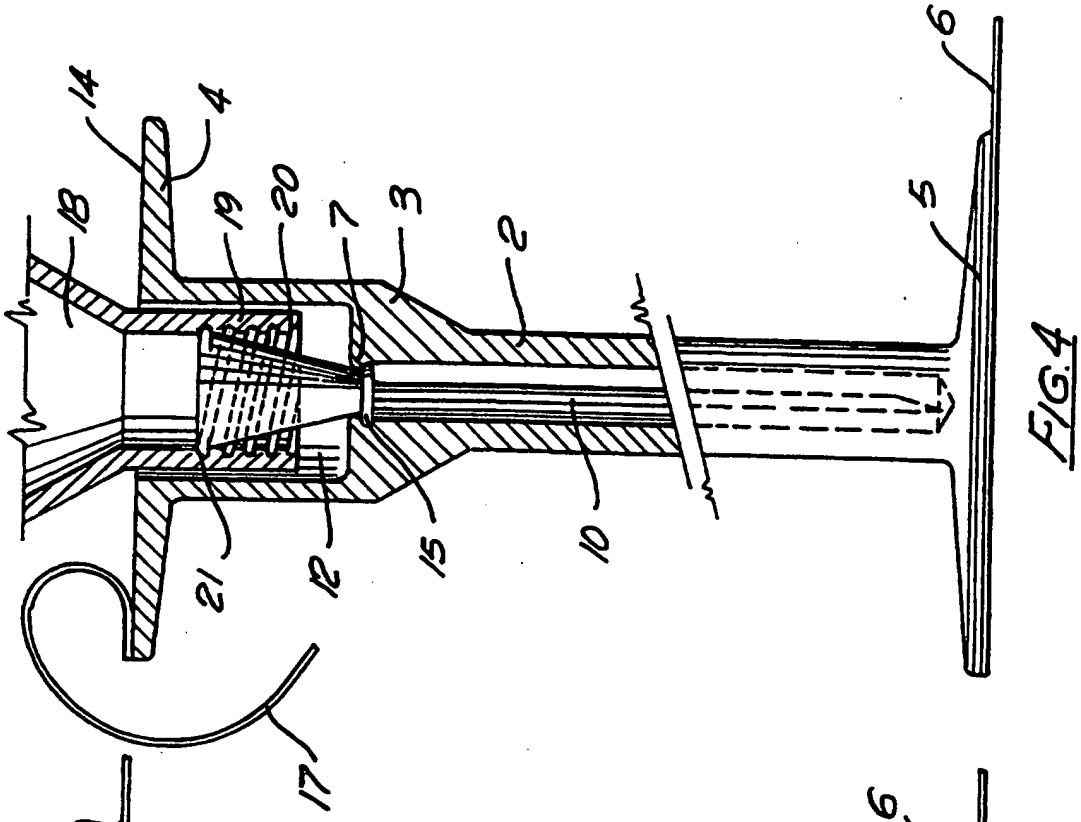

FIG. 4

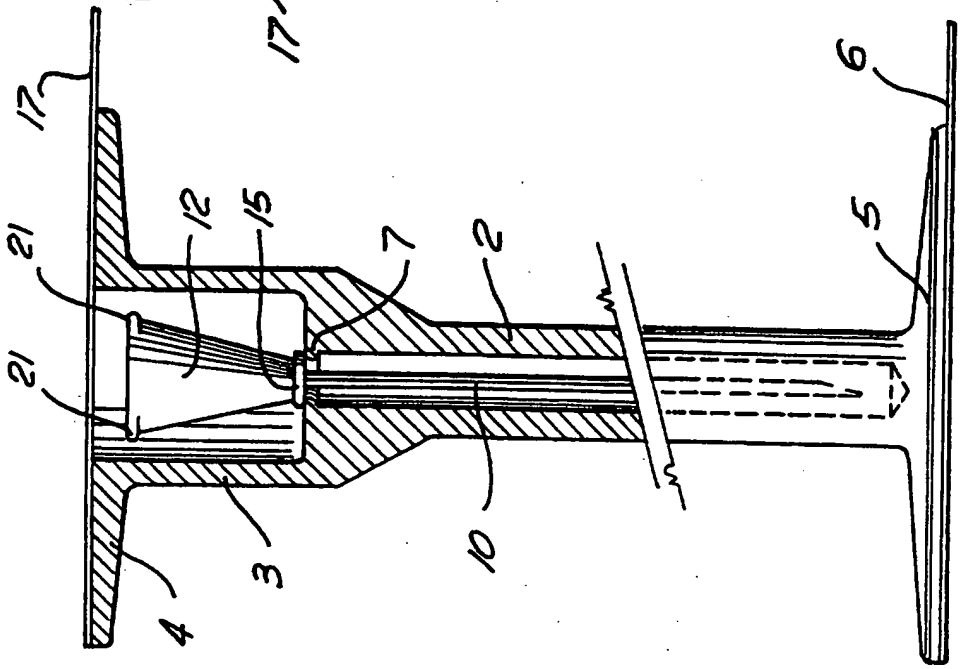

FIG. 3

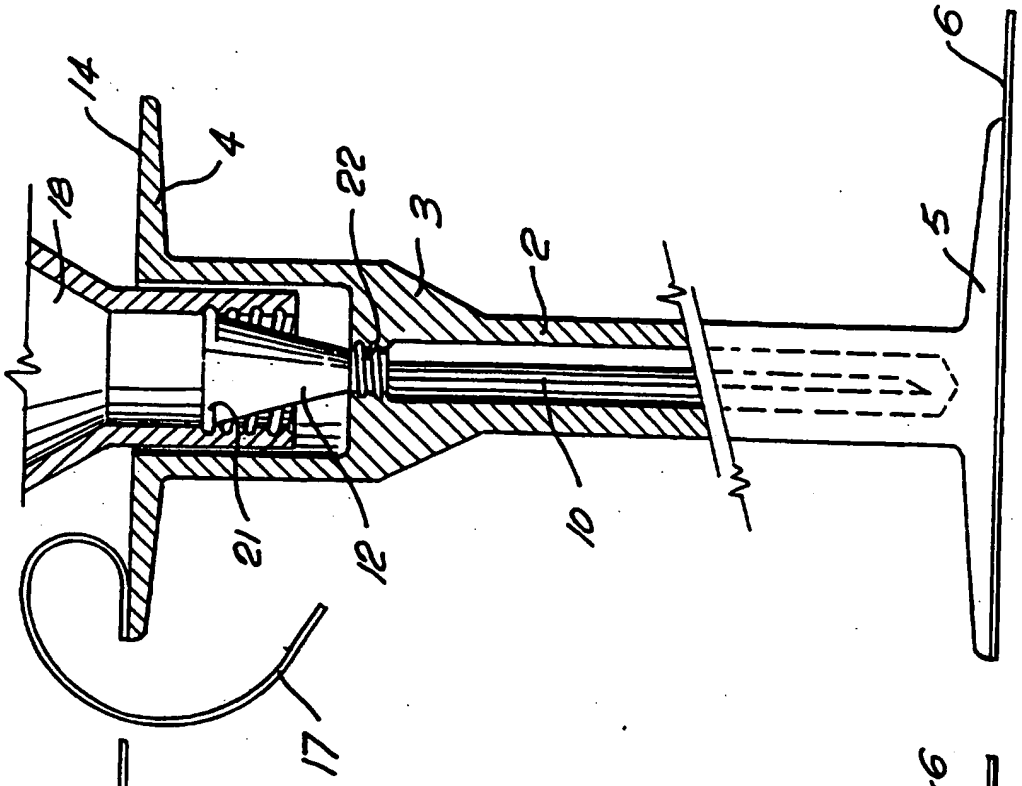

FIG. 6

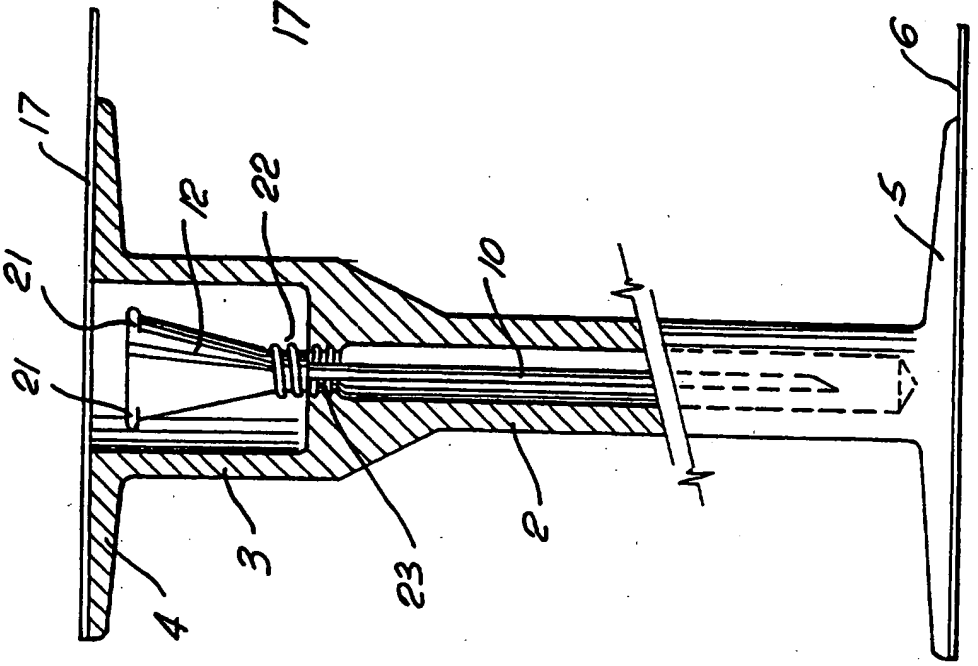

FIG. 5

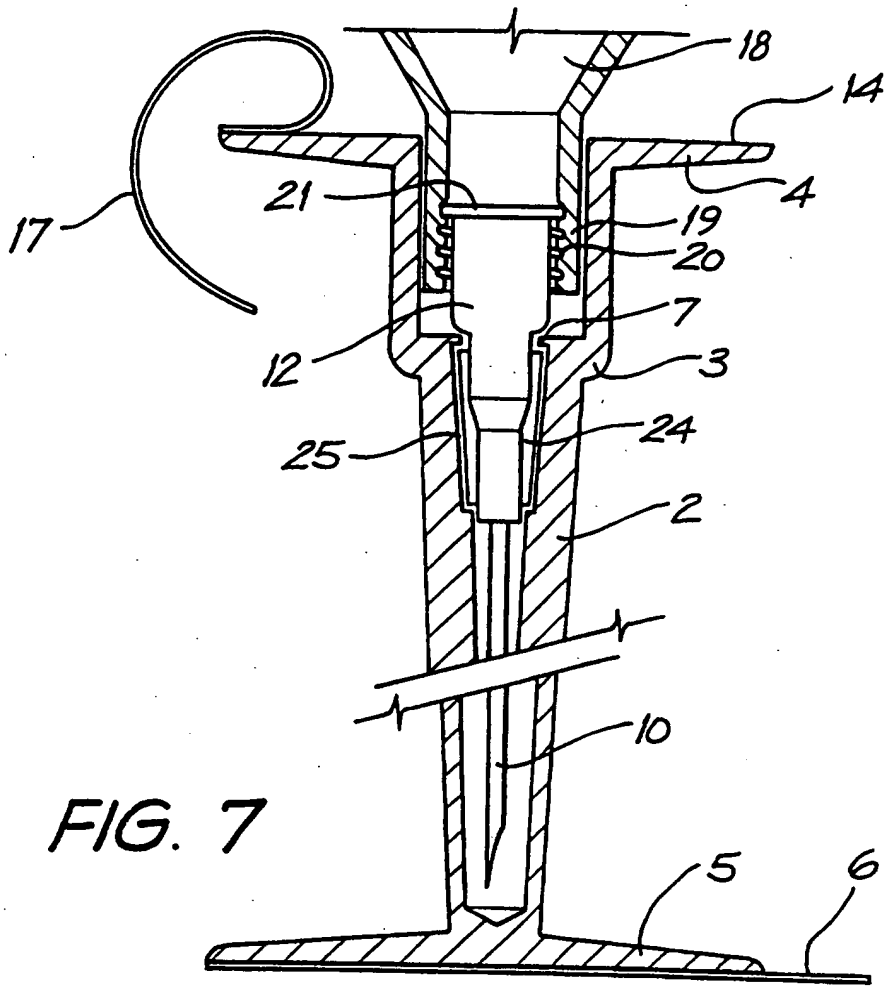

FIG. 7

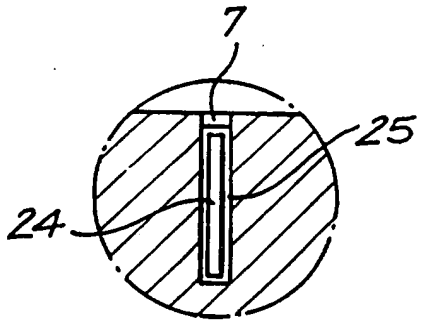

FIG. 7A

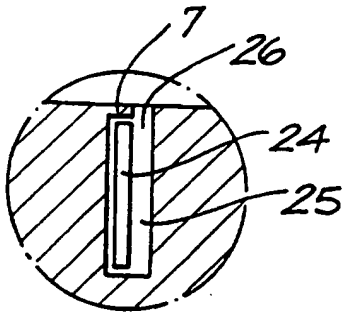

FIG. 7B

INTERNATIONAL SEARCH REPORT

International Application No.
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A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: A61M 5/32

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B. FIELDS SEARCHED

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AU IPC : A61M 5/32

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT & JAPIO & keywords (Needle#, contain:, housing, storage, cover, holder, retain:, secur:, lock:, stop:, engag:, sterile, seal:, hermetic:)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 92/13585 A1 (GALPIN, et al) 20 August 1992 figure 2	1 to 19 1, 13
X	US 4892525 A (HERMANN, Jr. et al) 9 January 1990 figure 3	1, 6, 10, 11, 12, 14 to 19
X	US 4573975 A (FRIST et al) 4 March 1986 figures 1 & 4	1

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C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1378806 A (AUSUBEL), 17 May 1921 figure 1	1
A	EP 364839 A1 (GI. BI. EFFE SR.L.) 25 April 1990	
A	WO 88/08313 A1 (McCAMMON, et al) 3 November 1988, figure 4	
A	WO 94/05352 A1 (ECKELS), 17 March 1994, figure 4	
A	FR 1200560 A (ROEHR ENGINEERING COMPANY), 22 December 1959, figure 1	
Y	GB 1125568 A (HOWARD), 28 August 1968 figure 1	1, 13
Y	GB 1235347 A (JINTAN TERUMO COMPANY LIMITED), 9 June 1971 figure 1	1, 13
Y	DE 2611448 A1 (WILSON), 31 March 1977 figure 2	1, 13

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No.
PCT/AU 96/00579

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Patent Document Cited in Search Report		Patent Family Member					
WO	9213585	AU	12224/92	CA	2103794	CN	1064814
		EP	571430	IL	100909	MX	9200581
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US	1378806						
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		US	5187850				
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